

June 26, 1991



Mr. Arturo Duran  
U S Environmental Protection Agency  
999 18th Street  
Denver, Colorado 80202

RE Final Treatability Studies Plan, Rocky Flats Plant, Golden, Colorado  
Work Assignment Number C08061, Contract Number 68-W9-0009 (TES 12)

Dear Mr. Duran

PRC Environmental Management, Inc (PRC) reviewed the final treatability studies plan (TSP) for the Rocky Flats Plant (RFP) under work assignment number C08061. The revised TSP and the accompanying appendices were compared with comments made on the draft document dated September 20, 1990. Most of the comments have been addressed in the revised document, and greater detail has improved the clarity. Inconsistencies throughout the document affect its utility. These are identified in the following general and specific comments.

#### GENERAL COMMENTS

- 1 There are inconsistencies throughout the revised TSP between statements made in the text and information presented in tables and appendices. It is unclear which information is intended to be utilized for site-wide treatability tests at RFP. References to technologies in the text, tables, and appendices should be consistent. In general, the document would be improved by including more detailed explanations of the information presented in tables.
- 2 The names used to refer to specific technologies in different parts of the document are not consistent. For example, "granular activated carbon adsorption" is discussed in the text (page 5-16, paragraph 5), while "activated carbon" is listed in table 5-4A. Names used to refer to various technologies should be consistent throughout the document.
- 3 The applicability of potential treatment technologies to specific contaminant groups is referred to in sections 5.2.2.1 and 5.2.2.2, in the technology data sheets (Appendix B), and on Tables 5-4A and 5-4B. It is not clear which contaminants will be treated by various technologies. Different references to the same technologies should be consistent.

RI 012 C08061 Rockyflats 06/14/91

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- 4 The final TSP considers innovative and emerging technologies as potentially applicable treatment alternatives for RFP. Many technologies have been eliminated during preliminary screening from consideration for treatability testing, and rationale have been listed in Tables 5-6A and 5-6B. One common reason for rejecting these technologies from consideration is that insufficient information is available to evaluate effectiveness, implementability or the potential of the technology to meet cleanup goals. Although little data may be currently available for innovative and emerging technologies presented in the TSP, they should be considered again in annual reports, as more information becomes available.

#### SPECIFIC COMMENTS

- 1 Page 4-11, Paragraph 4. The text indicates that technologies appropriate for treatment of polychlorinated biphenyls (PCBs) may be considered at a later date. PCBs have been found at RFP and alternatives for treating these compounds should be included in the screening process.

Rationale: The presence of PCBs at RFP requires consideration of potentially applicable treatment alternatives.

- 2 Page 5-1, Paragraph 4. The text states that technology data sheets have been provided in Appendix B for each technology retained for treatment of soils and sediments after preliminary screening, as listed in Table 5-5B. However, technology data sheets are only provided for some of the alternatives listed in Table 5-5B. Technology data sheets should be provided for each technology retained.

Rationale: Technology data sheets provide information on treatment alternatives which contribute to the final screening of treatment technologies for testing. Technology data sheets for all retained technologies should be included for review.

- 3 Page 5-3, Paragraph 5. The text indicates that statements of work (SOWs) are presented in Appendix C for each technology selected for bench-scale or lab-scale testing. However, SOWs are not presented for the same alternatives retained after preliminary screening as listed in Table 5-5B.

Rationale Consistency among text, tables and appendices of the revised TSP will contribute to the clarity and utility of the document All of the SOWs should be included in Appendix C for completeness

- 4 Page 5-5, Paragraph 5 Section 5 2 1 summarizes criteria used for rejecting or retaining potentially applicable treatment technologies More detailed rationale for rejecting technologies should be included for clarity In addition, reasons for rejecting specific technologies from further consideration are listed in Tables 5-6A and 5-6B The explicit screening comments also should be included as a column in Tables 5-4A and 5-4B to clearly present the rationale for rejecting or retaining technologies

Rationale Presenting the rationale for selecting or rejecting technologies for treatability tests is necessary to substantiate the screening process in the TSP In addition, the rationale in conjunction with the screening criteria clarifies the presentation of information

- 5 Page 5-8, Section 5 1 4 This section describes the differences between laboratory screening, and bench- or pilot-scale treatability studies Specific reasons for selecting laboratory screening and bench- or pilot-scale treatability tests for individual technologies have not been discussed Rationale for choosing different levels of treatability tests should be provided

Rationale Treatability tests are conducted to provide data necessary to evaluate the effectiveness and implementability of each technology at a specific site The level of treatability studies chosen as appropriate depends on the information available for each technology and the particular conditions of the site

- 6 Page 6-1, Section 6 0 This section describes the preparation of treatability study work plans However, there is no basis for prioritizing technologies for performing treatability studies The order in which tests will be conducted should be listed and discussed in the TSP

**Rationale** After preliminary screening of technologies for treatability studies, there should be an understanding of the processes involved in the individual treatability tests. In addition, the sequence in which tests will be conducted should be defined.

- 7 Tables 5-3A and 5-3B. These tables provide comprehensive lists of potentially applicable treatment technologies to be screened for treatability testing. The same list of technologies is provided in Tables 5-4A and 5-4B. Sections 5.2.2.1 and 5.2.2.2 of the final TSP present summaries of these technologies, and Appendix B contains technology data sheets for potentially applicable alternatives.

Neither the text nor the technology data sheets discuss the same list of technologies as Tables 5-3A and 5-3B. The treatment technologies discussed in the text and described in the technology data sheets should be consistent with Tables 5-3A, 5-3B, 5-4A, and 5-4B.

**Rationale** Consistency among text, tables and appendices of the revised TSP will contribute to the clarity and utility of the document.

- 8 Tables 5-4A and 5-4B. These tables list the preliminary screening criteria used to determine whether treatability tests should be performed for each treatment technology. However, relative costs of different technologies do not appear on these tables, nor are they discussed in the text. It is appropriate to defer the discussion of exact costs to site-specific treatability studies work plans, however, relative costs should be evaluated when determining whether to retain or eliminate technologies for treatability testing. A column listing relative costs should be included in Tables 5-4A and 5-4B.

The category labelled "Applicability" indicates the contaminants for which each technology is appropriate. In some cases, the contaminants have been incorrectly identified. For example, in Table 5-4A, page T-58, the elements for which the Techtran process is applicable have been identified as radium and thorium. This technology does not treat these radionuclides, but it is applicable for uranium, plutonium, and americium. The applicability of technologies listed in tables, appendices, and text should be consistent.

Within the category labelled "O&M Requirements" high, low and moderate qualifiers are listed for some technologies. The meanings of these terms are not defined in the text or in footnotes to the tables. Definitions of these terms should be included on the tables.

According to Tables 5-4A and 5-4B, conventional technologies such as granular activated carbon (GAC) adsorption and membrane processes such as reverse osmosis and electrodialysis have been retained for treatability tests. However, SOWs are not presented for GAC, reverse osmosis, electrodialysis, and other conventional technologies. It is not clear why these alternatives have not been included for bench-scale or lab-scale testing. An explanation should be provided for not including these procedures in the SOW section.

**Rationale** Cost information is a criteria for evaluating whether treatment technologies should be considered for treatability testing. Defining terminology will clarify the document and enhance understanding and consistency among text, tables, and appendices. Treatability studies are necessary to evaluate the effectiveness, implementability, and cost of conventional and demonstrated technologies for specific conditions at Rocky Flats.

- 9 Table 5-4B This table presents the preliminary screening criteria for treatability tests for soil and sediments. The information provided for each technology should be consistent throughout the document and supporting material, as well as within individual tables and sections. For example, on page T-64, soil washing is identified as being "available," while on page T-72, soil washing is listed as "innovative."

**Rationale** Consistency among text, tables, and appendices of the revised TSP will contribute to the clarity and utility of the document.

- 10 Table 5-5B This table presents the technologies applicable to various contaminant groups for soil/sediment treatment. The technologies are organized by treatment type. However, physical and chemical treatment technologies are combined in the same column. Physical and chemical treatments should be separated into different categories.

**Rationale** Different processes are involved in physical and chemical treatment technologies. Combining these types of alternatives into one column suggests that the technologies are related.

- 11 Appendix C This appendix contains the treatability studies SOWs which present the objectives and general procedures for each treatability study. However, the operational parameters involved in each test and how they will be optimized in the studies are not clearly defined in the SOWs. In addition, the specific procedures involved in each study are not described. SOWs should include more detailed descriptions of operational parameters and procedures.

The SOWs do not include explanations of monitoring of treatability tests or analysis of samples collected. Detailed discussions of monitoring and analytical procedures involved in specific treatability studies should be deferred to work plans for individual operable units (OUs). However, general introductions of the requirements for monitoring and analytical considerations should be presented in the SOWs.

**Rationale** Descriptions of the procedures involved and the information required to conduct the treatability studies selected will clarify the intent of the TSP. Every aspect of the treatability test process should be introduced in the TSP. In addition, the TSP should include strategies for planning the experiment, conducting the procedure, and evaluating the technology. Monitoring the experiment and analyzing input and output solutions, soils, or gases also are essential parts of treatability testing.

In summary, PRC's review of the final TSP indicates several issues which should be addressed before the plan is approved. The basis for most of the concerns is inconsistency between the document and its supporting material. By addressing differences between statements made in the text and information presented in tables and appendices, the overall clarity and utility of the document will be greatly improved. In addition, a discussion of the rationale for selecting or eliminating particular technologies would be useful and should be included in the tables and the text.

If you have any questions, please contact me or Josh Marvil at 295-1101.

Sincerely,  
PRC Environmental Management, Inc.

*Lynn A. Davies*

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LAD/al

cc Josh Marvil, PRC  
PRC file